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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,732	10/03/2005	Kunhiro Oda	OGOSH40USA	4329
270 7590 03/03/2010 HOWSON & HOWSON LLP 501 OFFICE CENTER DRIVE SUITE 210 FORT WASHINGTON, PA 19034				
EXAMINER FOGARTY, CAITLIN ANNE				
ART UNIT		PAPER NUMBER		
1793				
NOTIFICATION DATE		DELIVERY MODE		
03/03/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@howsonandhowson.com

Office Action Summary

Application No.

10/551,732

Applicant(s)

ODA ET AL.

Examiner

CAITLIN FOGARTY

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 7, 8, 13-27 and 29-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7, 8, 13-27 and 29-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of Claims

1. Claims 1 – 3, 7, 8, 13 – 27, and 29 – 31 are pending where claims 8, 29, and 30 have been amended. Claims 4 – 6, 9 – 12, and 28 have been cancelled.

Status of Previous Rejections

2. The objections to claims 29 and 30 have been withdrawn in view of the amended claims filed November 4, 2009.

The 35 U.S.C. 103(a) rejection of claims 1 – 3, 7, 8, 13 – 27, and 29 – 31 as being unpatentable over Segal et al. (US 2001/0054457 A1) has been maintained.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 1 – 3, 7, 8, 13 – 27, and 29 – 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Segal et al. (US 2001/0054457 A1).

Segal is applied to instant claims 1 – 3, 7, 8, 13 – 27, and 29 – 31 as set forth in the June 5, 2009 Office action. Claims 8, 29, and 30 have been amended. The amendments to claims 29 and 30 merely converted the temperatures to Kelvin in order to be consistent with the rest of the instant claims and did not change the scope of the claims.

With respect to amended instant claim 8, Segal does not specifically teach that the cast tantalum ingot or billet is made of a tantalum raw material having a purity of 4N5 (99.995%) or more. However, [0002] of Segal teaches that the method may be used to produce sputtering targets of high purity Al, Ti, Cu, **Ta**, Ni, Mo, Au, Ag, and Pt. Therefore, it would have been obvious to one of ordinary skill in the art to use a high purity Ta, such as 4N5, in the method of Segal in order to obtain a high purity sputtering target.

Response to Arguments

6. Applicant's arguments filed November 4, 2009 have been fully considered but they are not persuasive.

Arguments are summarized as follows:

a. All pending claims of the present application require a tantalum sputtering target having a "non-recrystallized" structure. In direct contrast, Segal discloses an aluminum-copper alloy sputtering target having a "recrystallized" structure. Accordingly, Segal teach to one of ordinary skill in the art the application of equal channel angular extrusion (ECAE) and that ECAE is required to be conducted under conditions where "dynamic recrystallization" occurs. Thus, one of ordinary skill in the art is aware that the sputtering target prepared according to Segal has a recrystallized structure (with fine and uniform grains of less than 1 μm). Accordingly, Segal fails to disclose a sputtering target with a non-recrystallized structure as required by all pending claims of the present application.

- b. The claims of the present application are clearly directed to a high purity tantalum sputtering target (not an alloy including tantalum). In contrast, the overwhelming majority of the disclosure provided by Segal is directly to an aluminum alloy having 0.5 wt% copper. The only minor reference to tantalum is in [0004] of Segal which states that the target can include one or more of various metals and which identifies Ta among a broad list of elements. Accordingly, Applicants respectfully submit that Segal fails to provide a fair disclosure with respect to a sputtering target made of pure Ta.
- c. Segal fails to teach the required hardness limitation with respect to a pure Ta sputtering target. Segal, which does not even disclose or discuss the hardness of a tantalum sputtering target, clearly fails to render such a limitation obvious or provide an enabling disclosure with respect to this limitation. Segal is simply directed to an Al-Cu alloy and fails to disclose anything relative to a pure Ta target or how to avoid the outcomes experienced by the Ta targets of comparative examples 1-3 of the present application.

Examiner's responses are as follows:

- a. The Examiner takes the position that [0078] and [0079] of Segal teach the embodiment of intermediate annealing between extrusion passes at low temperature or just at the beginning of static recrystallization. Therefore, it would have been obvious to one of ordinary skill in the art to follow this embodiment of Segal to produce a Ta sputtering target with a non-recrystallized structure. Although Segal teaches that the final product is recrystallized, the Examiner

takes the position that it would have been obvious to one of ordinary skill in the art to stop the method of Segal after the intermediate step in order to obtain a tantalum sputtering target with a non-recrystallized structure if the desired use of the tantalum sputtering target is to obtain a film with a non-recrystallized structure. It is well known in the art that a thin film deposition formed by the bombardment of the sputtering target with energetic particles has the same microstructure as that of the sputtering target.

b. The Examiner maintains the position that the broadest teaching of Segal in [0002] discloses that the method may be used to produce sputtering targets of high purity Al, Ti, Cu, Ta, Ni, Mo, Au, Ag, and Pt. Furthermore, the scope of Segal is not limited to the specific embodiments it teaches. See MPEP 2123. Therefore, it would have been obvious to one of ordinary skill in the art to use a high purity Ta, such as 4N5, in the method of Segal. In addition, merely purifying a known prior art composition would not be sufficient to distinguish from the prior art composition. See MPEP 2144.04 VII.

c. As discussed above in response (b), the Examiner maintains the position that Segal teaches a method that may be used to produce a high purity Ta sputtering target. In regards to the claimed hardness limitation, Segal does not specifically teach the Vickers hardness of the Ta sputtering target. However, in the absence of factual evidence to the contrary, one of ordinary skill in the art would have expected the Ta sputtering target of Segal to have a similar Vickers hardness since it is made using a method similar to that of the instant invention.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 6,348,113 from the IDS teaches a tantalum sputtering target with a partially non-recrystallized structure as recited in the instant claims.
8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **CAITLIN FOGARTY** whose telephone number is (571)270-3589. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

CF